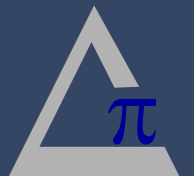




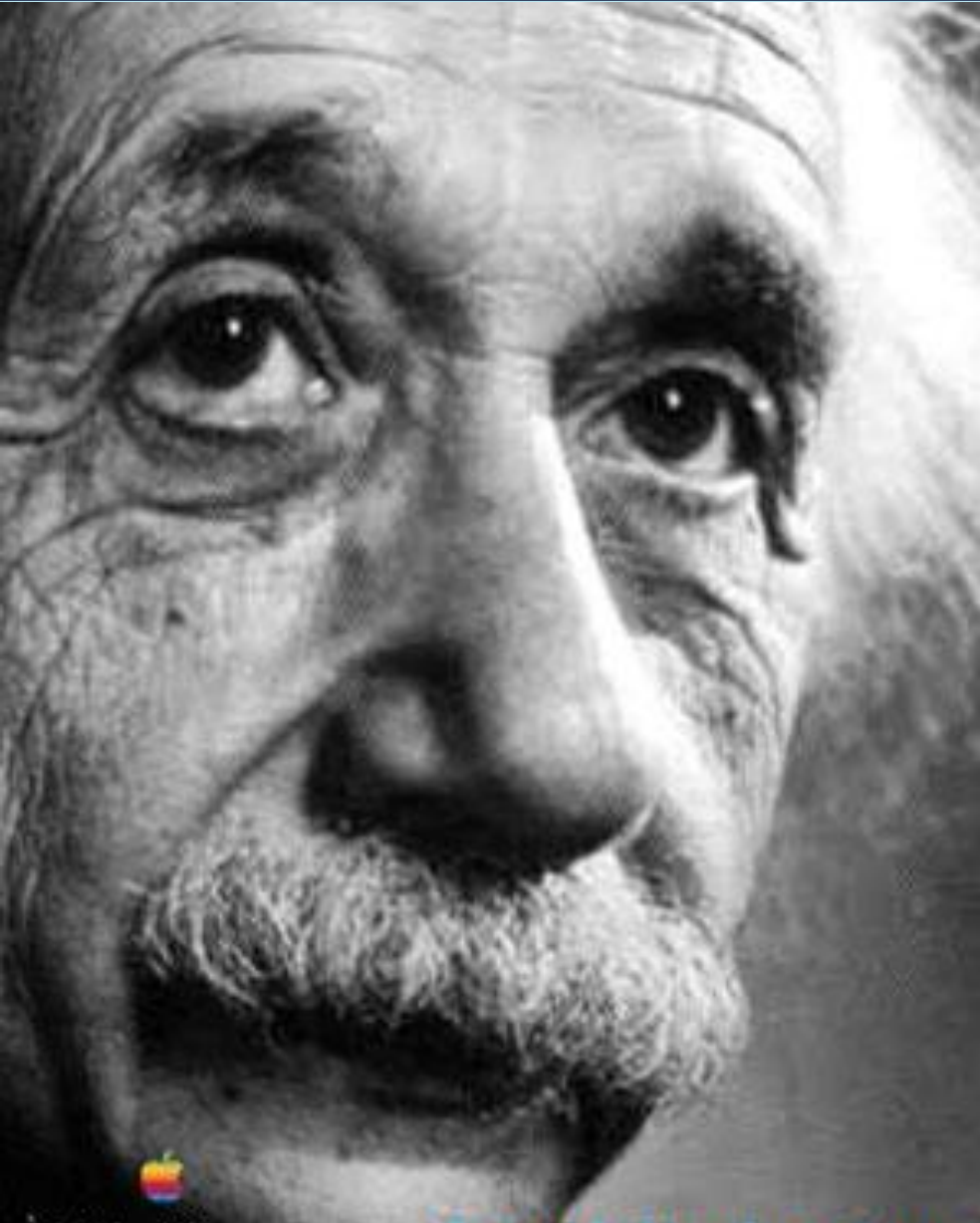
**Anders kijken, meer bereiken**

## **Activity-Based LCC**

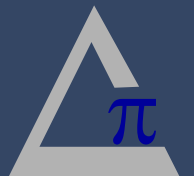
Peter Van Gestel



# Thesis and statements



As far as the laws of  
mathematics refer to reality,  
they are not certain;  
and as far they are certain,  
they do not refer to reality



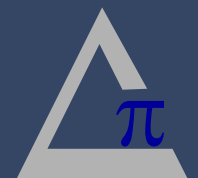


JAN EMBLEMSVÅG



# LIFE-CYCLE COSTING

*Using Activity-Based Costing  
and Monte Carlo Methods  
to Manage Future Costs and Risks*



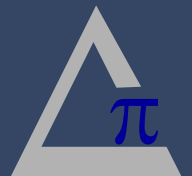


# Why activity-based Life-Cycle Costing (see Life-Cycle Costing Jan Emblemsvåg)



- ▲ Cost management and budgeting of the future should concern itself with:
  1. Identifying the underlying drivers
  2. Managing the business performance
  3. Managing the risks

Costs are statistical in nature and cannot be managed unless we understand the underlying drivers.

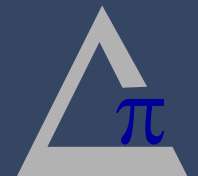
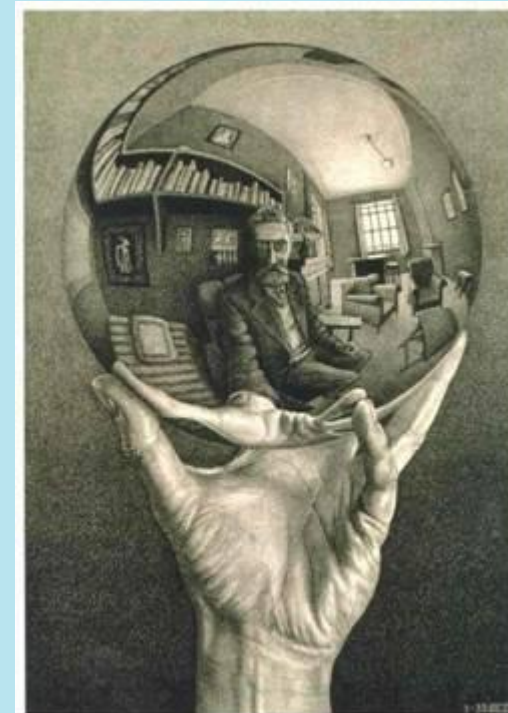


# The idea behind activity-based Life-Cycle Costing



Structuring cost leads to cost cutting,

Tracing process oriented cost leads to insight



# Activity-Based LCC Equation



Activity-Based LCC

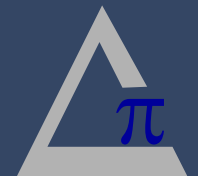
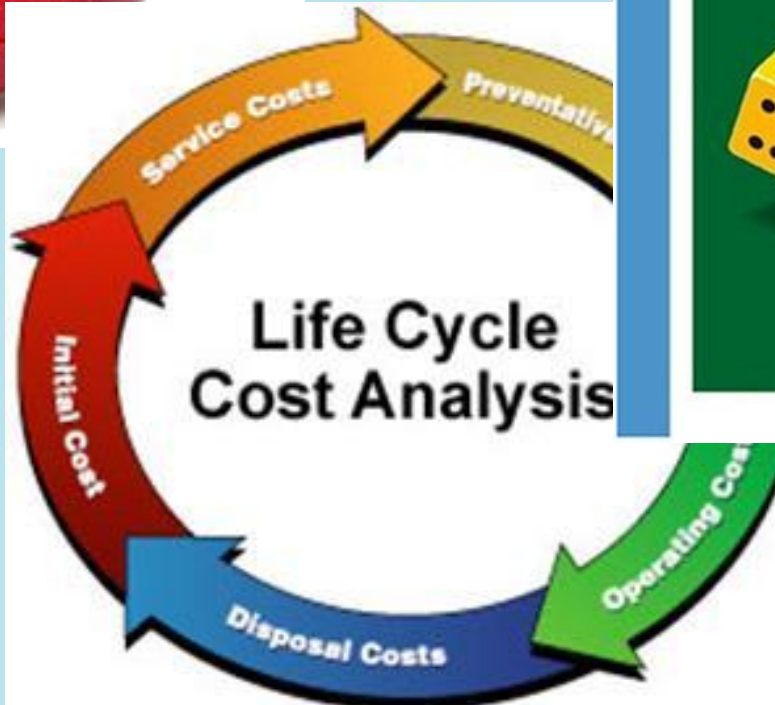
=

ABC + LCC + MCM

Malvin H. Kalos, Paula A. Whitlock

WILEY-VCH

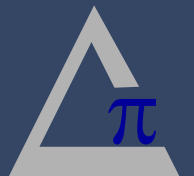
Monte Carlo  
Methods



# Winst = Opbrengst - Kosten



Opbrengst	15
<u>Kosten</u>	<u>10</u>
Winst	5

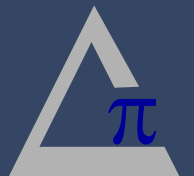


# Zekere Winst



O	15
<u>K</u>	<u>10</u>
W	5

Als  $O > K \rightarrow W > 0$





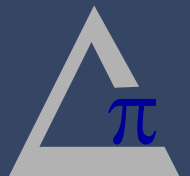
# Winst met risico



NPV = Net Present Value

Stel  
 $O - K = 5 > 0$

$$NPV(O) - NPV(K) = NPV(W) > 0 ?$$

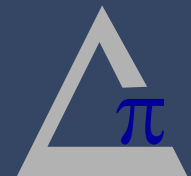


$$W(O, K, R, D) > 0 ?$$



Opbrengst	15
Kosten	10
Winst	5
rente	9% ← risico
begin jaar	2009
duur	6jaar

		2009	2010	2011	2012	2013	2014
NPV(O)	€ 9,75	0	0	0	0	0	15
NPV(K)	€ 10,00	10	0	0	0	0	0
NPV(W)	€ -0,25						



# Onzekere Winstverwachting



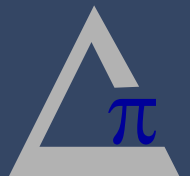
E = Expectation

Stel

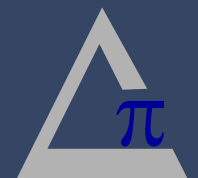
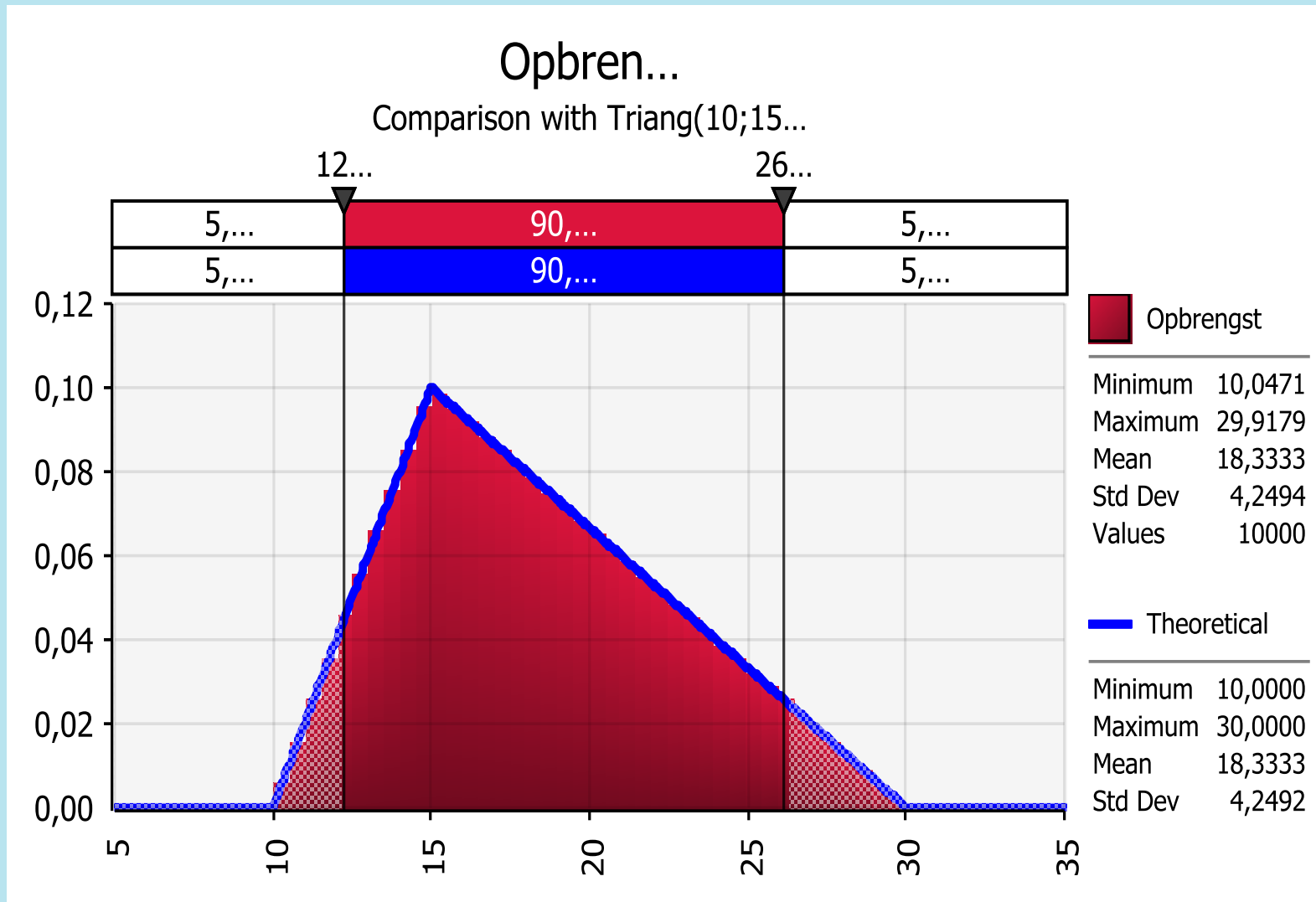
$$NPV(O) - NPV(K) = NPV(W) > 0$$

$$E NPV(O) - E NPV(K) = E NPV(W) > 0 ?$$

Onzekere begrotingen bieden realistische verwachtingen!

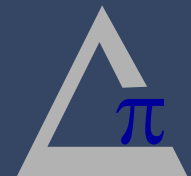
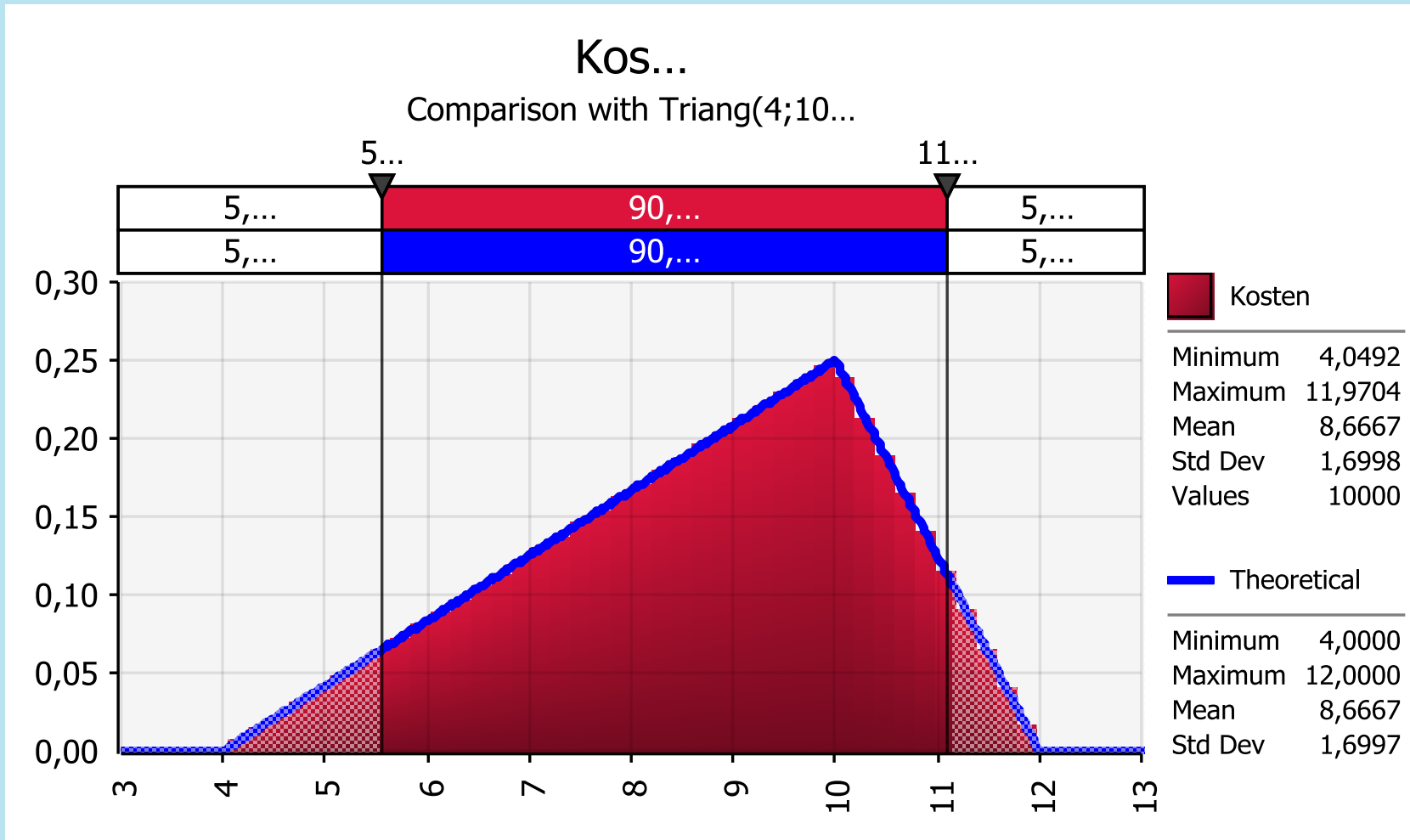


# O verdeling

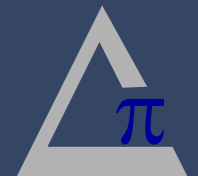
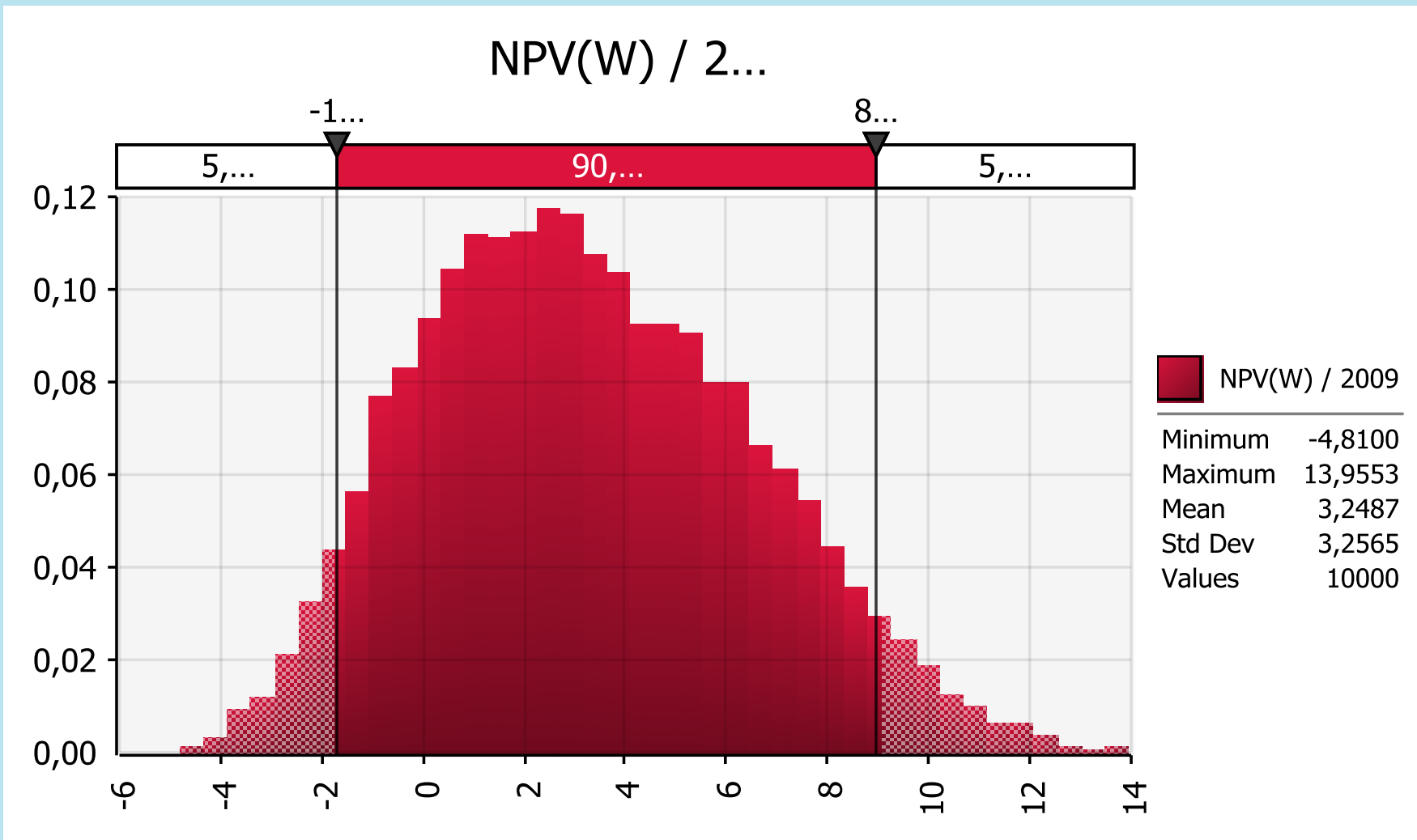




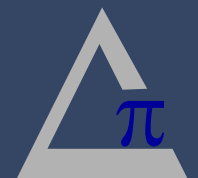
# K verdeling



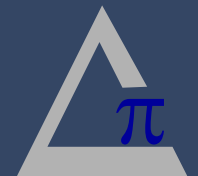
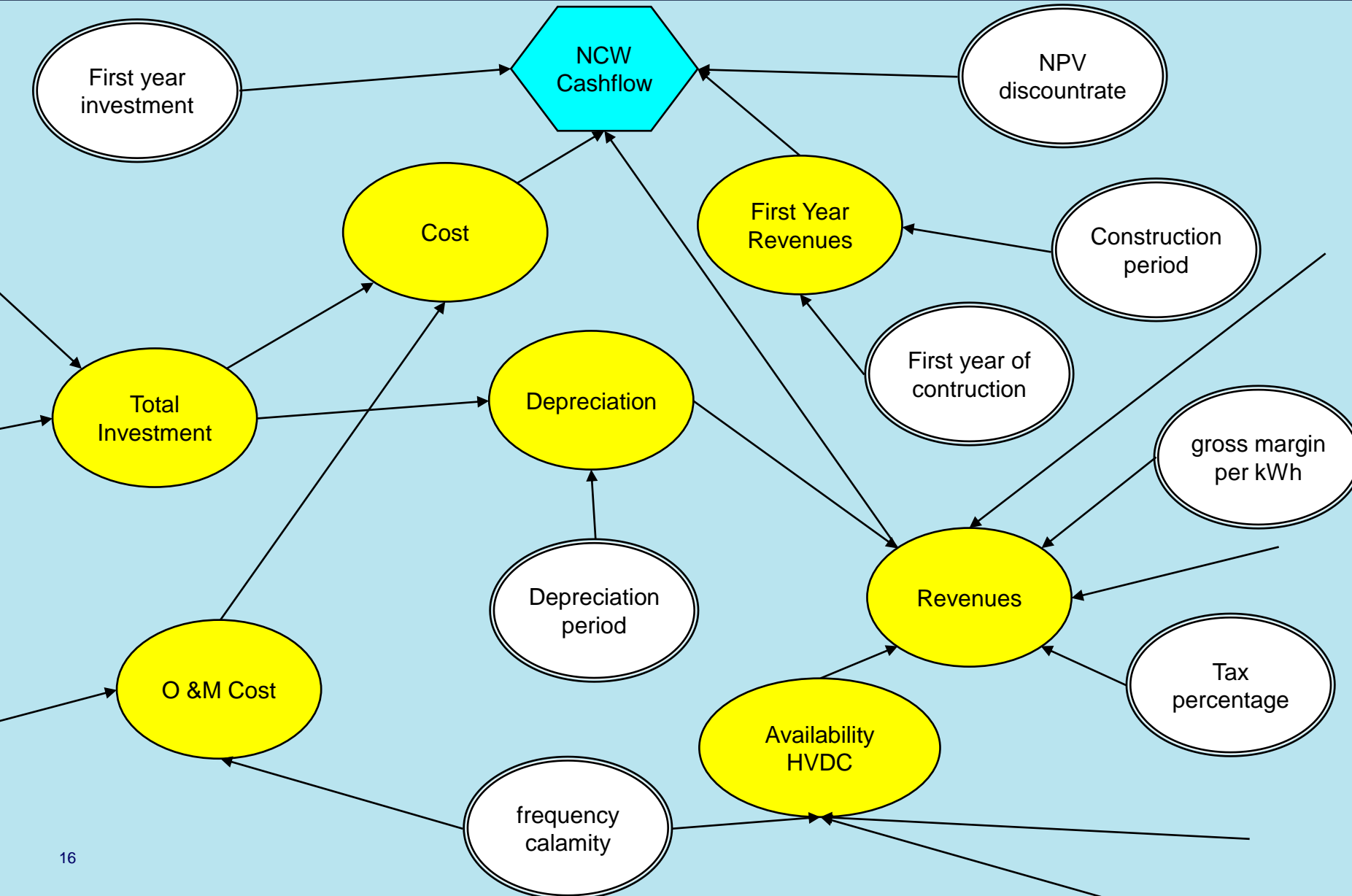
# NPV (W) verdeling; Gemiddelde = 3,25 > 0



# HVDC Norway- Netherlands (Yes or No?)



# Influence diagram

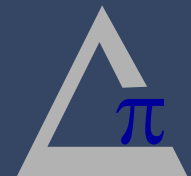




# HVDC Norway- Netherlands Input



Low	Base	High	Variable Description
6%	8%	10%	NPV discount rate
237,5	250	300	Investment per year
2004	2004	2004	First year of Investment
2	2	2	Investment period
2004	2004	2004	First year of construction
2	2	2	Construction period
30	40	50	Exploitation period
1	1	2	Preventive maintenance frequency
4	5	6	Preventive Maintenance Cost each time
150	200	300	Preventive Maintenance Duration
50%	50%	50%	Effect Preventive Maintenance on Availability HVDC
2	5	10	Failure frequency
1	2	3	Corrective Maintenance Cost each time
24	48	72	Corrective Maintenance Duration
100%	100%	100%	Effect Corrective Maintenance on Availability HVDC
0,01	0,05	0,1	Probability Calamity per year
5	10	15	Cost Calamity each time
72	168	730	Calamity Duration
100%	100%	100%	Effect Calamity on Availability HVDC
30%	35%	37%	Tax percentage
375	500	550	Power
0,017	0,02	0,03	Gross margin per kWh
15	20	25	Depreciation time window



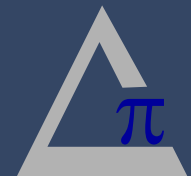
# HVDC Norway- Netherlands (No!)



NPV_Calc_period	42
Unavailability for production (PM)	1,65%
Unavailability for production (CM)	3,30% <b>corrective + calamities</b>
Availability for production	95,10%
Production	3957263,23 [MWh / year]
Turnover	79,15 [MEUR / year]
Exploitation costs	18,53 [MEUR / year]
Gross margin	60,61 [MEUR / year]
Cashflow without depreciation	40,00 [MEUR / year]
Cashflow with depreciation	48,93 [MEUR / year]

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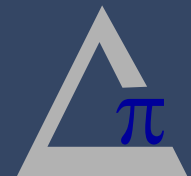
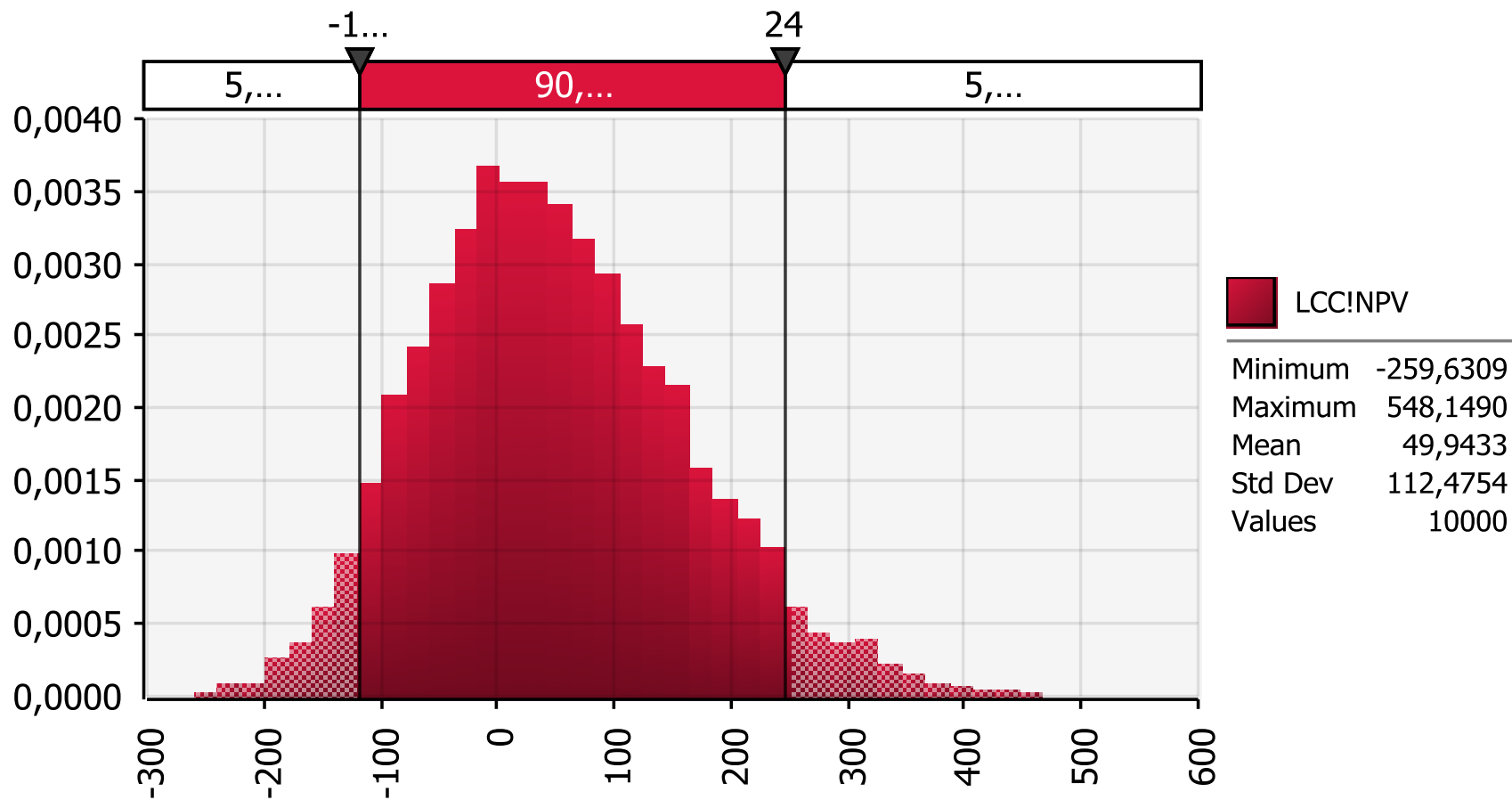
		2004	2005	2006
NPV investment	-505,56	262,50	262,50	0,00
NPV cashflow during depreciation time	411,86	0,00	0,00	48,93
NPV cashflow after depreciation time	78,02	0,00	0,00	0,00
NPV total	-15,67 [MEUR]			



# HVDC Norway- Netherlands (Yes !)



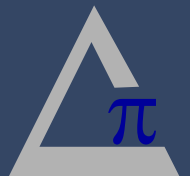
LCC!...



# Activity-Based LCC en de toekomst



- ▲  $AB\ LCC = ABC + LCC + MCM$
- ▲ Ideeën voor de toekomst:
  - ▲ RBB (Risk Based Budgeting)
  - ▲ Continu actualiseren korte termijn budgettering
  - ▲ Incorporeer risicomanagement ook in cost management





# Stelling



Zonder statistiek geen goede besluitvorming!

